

The nation needs thousands of airplanes for defense. How is the aircraft industry meeting this challenge? You will find the answer in the story on factory expansion. (Cols. 7-8.)

What about new fighting planes for the Army and Navy? That top story in Col. 4 tells about them.

And as a new and fascinating version of the time-proven Question & Answer feature, may we suggest "Aeroquiz"? (Col. 1.)

As for art, a postcard addressed to the Aviation News Committee, 7046 Hollywood Blvd., Los Angeles, Calif., will bring you, by return mail, mats or glossy prints of the pictures in this issue.

# Aviation News Features

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## EXPANDING FOR DEFENSE



Airplane, Engine and Propeller Factory Working Space

The aircraft industry is meeting the need for thousands of military airplanes with a history-making program of plant expansions. Against a background of men and steel at a new factory building, this chart, prepared by the Aeronautical Chamber of Commerce of America, shows how airplane, engine and propeller manufacturers of the nation have increased the size of their factories since the outbreak of the war in Europe and how, by the time present expansion programs are completed, the total working area will have grown to more than 33,000,000 square feet.

(EDITORS: IF YOU HAVE NOT ALREADY REQUESTED SAME, MAT OR GLOSSY PRINT OF THE ABOVE WILL BE MAILED ON REQUEST. WRITE TO AVIATION NEWS COMMITTEE, 7046 HOLLYWOOD BLVD., LOS ANGELES, CALIF.)

## Expanding Plane Plants Mean More Residents, Bigger Payrolls

Case of San Diego Shows How Industry Adds to Prosperity of Typical Community

SAN DIEGO, Nov. 00.—Millions of dollars are being spent on plant expansions and thousands of skilled workers are being added to payrolls as aircraft manufacturers race into the creation of a mighty air force for the nation's defense.

What effect is this vast expansion, this upsurge of employment, having on the economic structure of communities where airplane plants are located? To answer this question, a researcher for the Aviation News Committee of the Aeronautical Chamber of Commerce of America visited San Diego, Calif.

THE 1930 census gave San Diego a population of 147,995. Its limited basic industries—tuna fishing, boat building, some manufacturing—hardly classified it as an industrial community. But Army and Navy bases were located here and the city's prosperity consequently rested heavily upon payrolls of service personnel, which consequently fluctuated with the comings and goings of the Fleet.

From an aeronautical standpoint San Diego had two distinct advantages—almost perfect weather and an excellent airport practically in the center of the city.

In 1935, Major R. H. Fleet decided to bring his Consolidated Aircraft Corporation to San Diego. At that time the city's industrial payroll was \$15,000,000.

Today San Diego has four aircraft and aircraft parts plants—Consolidated, Ryan Aeronautical Company, Solar Aircraft Company, Rohr Aircraft Company—employing more than 14,000 workers. Largely as a result of the coming of this industry, San Diego's industrial payroll has risen to approximately \$20,000,000 in 1940.

Two new theaters and between 25 and 30 grocery stores have been built.

And what of the future? 20,400 NEW WORKERS Consolidated Aircraft, now hiring workers at a rate of 300 weekly, expects to add 13,000 new employees to its payroll within the next eight months. The smaller plants are

## PLANE FACTS:

### New Flying Forts for U.S. Air Corps

New type gun turrets and more powerful motors characterize the B-17C, latest of the famous family of Flying Fortresses.

The ships, ordered by the U. S. Army Air Corps, are now being completed at the Seattle, Washington, plant of Boeing Aircraft Company at the rate of one ship every two working days. The newest Flying Fortresses are four-motored low-wing bombers, capable of speeds in excess of 300 miles per hour and with a cruising range of more than 3000 miles. Machine gun "blisters" of the earlier Flying Fortress models have been replaced by flat type turrets.

How are we doing on national defense aircraft production? Well, General George Brett of the Army Air Corps and Admiral J. H. Towers of the Navy Bureau of Aeronautics agreed recently that the aircraft programs of both services will be completed well ahead of schedule.

So extensive is the Consolidated Aircraft Corporation plant at San Diego, California, that employees use bicycles to travel from building to building.

Twenty-one PT-14 training planes are leaving the plant of the Waco Aircraft Company at Troy, Ohio, each week. The ships will be utilized for the Civilian Pilot Training Program.

## Army, Navy Get Newest War Planes

### U. S. Producing Swift, Versatile Defense Aircraft

(Note: This is the second of two articles dealing with the newest American defense airplanes. It describes types of military aircraft being developed and produced in eastern factories. The first article described products of factories on the West Coast.)

NEW YORK, Nov. 00.—Down the assembly lines of rapidly-expanding factories in New York, Maryland, Connecticut and other eastern states are rolling today some of the swiftest, most deadly and most versatile fighting aircraft the world has ever seen.

Mere mention of some of the names—the Airacobra, the P-40, the Skyrocket, the PBM—brings a thrill of pride to air-conscious Americans. Actual production is being speeded up on a majority of these planes as aircraft plants in the eastern United States, like those on the Pacific Coast, work night and day to arm America in the air.

### THE NEW AIRACUADA

A few days ago the Army Air Corps announced delivery of the first of the new Bell Airacudas, swift and formidable twin-engine planes, officially designated as "fighters," which carry bombs, have five-man crews and are armed with cannons and machine guns firing from the front, sides and rear.

Also in production at the Bell Aircraft factory are the Airacobras, bullet-rimed interceptor pursuits armed with cannon firing through the propeller hub and credited by their makers with a maximum speed of "about 400 miles per hour."

Appearing in ever-increasing numbers for the Air Corps are the famous Curtiss P-40s. Like the Airacobra, the P-40 is an extremely fast, highly streamlined single-seat pursuit powered by an allied as one of the most maneuverable fighting planes in the world.

### SHIPBOARD FIGHTERS

Designed for the Navy as shipboard fighters are three new single-seaters: the Brewster F2A-1, the Grumman F4-F3 and the Grumman Skyrocket. The Skyrocket, among the newest of our aircraft, is powered by two 1200 horsepower Wright Cyclones and is reported to be one of the fastest-climbing planes in the world.

Highly important to the defense needs of both the Army and Navy are two new types now building in Baltimore. Destined for the Navy are the Martin PBM type of long range patrol and bombardment flying boats, designed for patrol and defense missions far at sea.

For the Army is the Martin B-26, a new twin-engine bomber whose performance cannot be disclosed. But it is said that the B-25 will be the world's fastest bomber, carrying a heavy load of bombs.

Recently delivered to the Army is the new Republic YP-43 pursuit interceptor, a faster model of the Republic P-35 with which several squadrons of the GHQ air force are now equipped.

### FOR THE NAVY

High performance (and seemingly baffling designations) are characteristic of the Vought-Sikorsky OS2V-1, OS2V-2 and SB2U-3, being produced for the Navy and Marine Corps (OS stands for "observation scout" and SB for "scout bomber"). The former are speedy, heavily armored monoplanes with interchangeable pontoons and landing wheels, intended primarily for scouting, gunfire spotting and other naval jobs. The SB2U-3, a Marine Corps ship, is a scout dive bomber with folding wings to be carrier-based.

To train the men who fly these varied types of aircraft for Uncle Sam's fighting services, production is being pushed on such training planes as the Fairchild, Waco and Stearman.

### MOTORS AND MEN

Five thousand man hours go into the building of a 14-cylinder aircraft motor, from rough casting to finished product.

## Let Rivets Fall Where They May—Machine at Plane Plant Sorts Such Things

BALTIMORE, Nov. 00.—A new rivet-sorting machine which is expected to make a substantial contribution to the company's national defense production efficiency has been invented by shop technicians at The Glenn L. Martin Company at Baltimore.

Rivets have a habit of getting mixed up, falling on the floor and otherwise ending up with waste scrap metals. Airplane rivets are worth about \$1.00 a pound. Ordinarily they are hand-sorted at the rate of about 1000 a day. The new device, which will thus save something like \$12,500 annually, first eliminates the scrap metal, filings, etc., from the sweep-up rivets, and then separates the round-headed from the flat-headed types. When this process is completed, the two varieties are separated as to length and dropped into receptacles, the entire process being automatic.

More than 150 different sizes and types of rivets are used in the construction of the larger-sized airplanes.

They did just that at the engine factory of the Wright Aeronautical Corporation in Paterson, N. J., to test the interchangeability of parts. The four reassembled motors functioned perfectly.

is approximately two million miles. Routine overhaul is required only at 100,000-mile intervals, or practically twice the life of the average automobile.

### THOUSANDS OF PARTS

To achieve this efficiency and precision, the aircraft motor has 5500 parts, which must be machined, inspected and assembled, requiring 5000 man hours of work and some 35,000 operations for each motor.

In all, there are 45,000 inspection operations involved in building a single motor, and some of the parts are accurate to 1-2,000,000th of an inch—200 times finer than the thinnest spider web.

Despite all this, aircraft motor manufacturers are forging ahead into mass production as their contribution to the work of arming America in the air.

### MORE JOBS, MORE PAY

In California, where seven major airplane factories are working "around the clock" for national defense, employment in the aircraft industry has risen 142.8 per cent in a year, while weekly payrolls are up 174.7 per cent and average weekly earnings have increased 13.1 per cent over 1939. In other sections of the country, aircraft production has caused similar stimulation of employment.

### INSURANCE BROADENED

Removal of air travel restrictions in its insurance policies for the entire western hemisphere has been announced by the Mutual Life Insurance Companies of New York. The new liberalized clauses in such policies apply to removing restrictions on all American-flag passenger air travel on regular routes between established airports in the West Indies, Central America and South America.

### Study of High Altitude Conditions Is Possible in Laboratory

60,000 feet—more than 11 miles above sea level!

### Strato-chamber Example of Plane Builders' Research Work

SEATTLE, Nov. 00.—Higher and higher go the aircraft of war—and of peace.

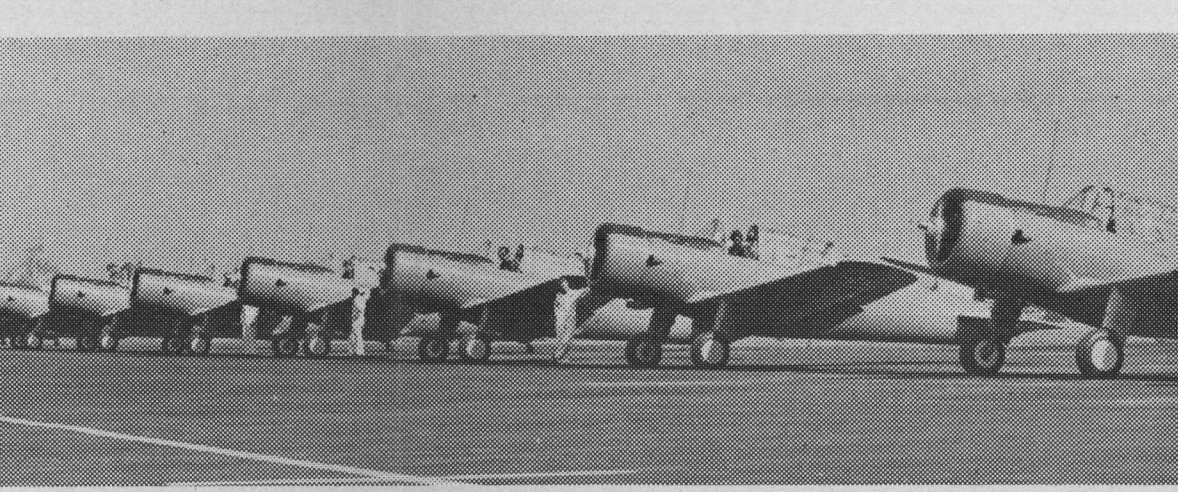
Modern pursuit ships must be able to climb swiftly to 30,000 feet or higher to intercept enemy bombers and their fighter escorts. Airliners of 1940 can operate at 15,000 to 20,000 feet without discomfort to passengers.

Men on the ground—researchers and engineers—have made this possible. Here, in the factory of the Boeing Aircraft Company, is found an example of the manner in which the nation's aircraft industry has engaged in research to keep America abreast of aeronautical development and prepare for future technological advances.

Boeing engineers have perfected the "strato-chamber" which permits them to duplicate in their laboratories the atmospheric conditions encountered as high as seven miles in the air. Similar experiments have been made by other companies in the United States.

The experimental and development work made possible by this laboratory apparatus is considered of highest importance, to both

## THE U. S. AIRCRAFT INDUSTRY TURNS 'EM OUT!



Symbolizing the aircraft industry's quantity production of airplanes for national defense was this record mass delivery of basic trainers to the U. S. Army Air Corps by Vultee Aircraft, Inc., at Downey, Calif. Army pilots flew the 33 ships to the new pilot training center at Moffett Field, near San Francisco. (EDITORS: IF YOU HAVE NOT ALREADY REQUESTED SAME, MAT OR GLOSSY PRINT OF THE ABOVE WILL BE MAILED ON REQUEST. WRITE TO AVIATION NEWS COMMITTEE, 7046 HOLLYWOOD BLVD., LOS ANGELES, CALIF.)

## Aircraft Plants Rush Big Expansion Program

### Work Being Speeded on Projects to Step Up Production of National Defense Air Force for U. S.

Skeletons of steel rise magically against the sky, riveting machines chatter incessantly... riggers, steel and concrete workers, masons, carpenters swarm, day and night, over what a few weeks ago were barren fields...

In full swing from the Atlantic to the Pacific is one of the greatest programs of industrial expansion in history—the answer of the American aircraft industry to the nation's cry for more and more airplanes for defense.

By 1942, when this program is completed, the leading airplane, motor and propeller manufacturers of the land will have a total working space of 33,370,822 square feet, an area big enough to hold 580 football fields! These same companies have already, in a matter of 13 months, increased their total working area from 9,123,143 square feet to 16,703,230 square feet.

Such were the findings of a November survey by the Aviation News Committee of the Aeronautical Chamber of Commerce of America. So rapidly is the dynamic picture of aircraft plant expansion changing that a complete survey in December by Colonel J. H. Jouett, president of the Aeronautical Chamber, will be made to keep the nation abreast of progress.

The Aviation News Committee's survey showed the following activity:

WEST COAST	THE EAST
LOS ANGELES, Nov. 00.—An area equivalent to 82 city blocks devoted to the building of aircraft for American defense.	NEW YORK, Nov. 00.—More space in which to build more airplanes, engines and propellers—this was the chief problem confronting the aircraft industry when it was called upon to create a powerful air force for national defense.
This is the goal six leading Pacific Coast aircraft factories will achieve when they complete present expansion schedules in their drive to reach peak production.	How the problem is being met by manufacturers in the East and Mid-West is told graphically in the following figures:
When the European war broke in September, 1939, total working space for the six companies was 4,188,143 square feet. Today that total has climbed to 7,909,230 square feet. When expansion programs are completed, the total working space of the six plants will be 15,888,110 square feet.	Among the major airplane manufacturers in the eastern area are Glenn L. Martin, Bell Aircraft, Republic Aviation, Grumman Aircraft, Fairchild Aircraft, Vought-Sikorsky division of United Aircraft, Curtiss Aeroplane division of Curtiss-Wright Corporation and the Curtiss-Wright Corporation's St. Louis Airplane division.
FROM BORDER TO BORDER From Seattle, Wash., home nest of the famed Boeing Flying Fortress bombers, to San Diego, where Consolidated Aircraft is building a fleet of long-range land bombers and patrol bomber flying boats for the Army and the Navy, the work of expansion is in full swing.	These companies have planned or actually have under construction expansion projects calling for creation of 4,917,172 square feet of additional working space. In the period between Sept. 1, 1939, and Nov. 15, 1940, they increased their floor space from 2,535,000 square feet to 3,597,000 square feet. When their expansion programs are completed they will have a grand total of 8,514,712 square feet of working space.
LOS ANGELES has the greatest concentration of aircraft factories of any single area in the nation and here expansion activities have reached a peak.	ENGINE EXPANSION The story is the same among the engine manufacturers. For the five leading companies—Pratt & Whitney, Wright Aeronautical, Jacobs, Lycoming and Allison—the figures read:
Douglas Aircraft Company, busy with the largest military airplane order ever awarded one company, is expanding existing facilities and soon will build a vast new factory at nearby Long Beach. Lockheed Aircraft Corporation is erecting new units for greater production of the famed P-38 pursuit interceptors and Hudson bombers.	Floor space, Sept. 1, 1939, 2,030,000 square feet; Nov. 15, 1940, 4,677,000 square feet; planned or under construction, 3,211,000 square feet; grand total, 7,888,000 square feet.
Vultee Aircraft, Inc., in addition to its California plant, has taken over Stinson Aircraft and plans big expansions at Nashville, Tenn., and Wayne, Mich. And North American Aviation, Inc., which has been adding constantly to its California plant, is now at work on a huge new windowless, air-conditioned factory near Dallas, Tex.	And for the major propeller manufacturers—Hamilton Standard and Curtiss: Sept. 1, 1939, 370,000 square feet; Nov. 15, 1940, 530,000 square feet; planned or under construction, 550,000 square feet; grand total, 1,880,000 square feet.

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## Engineers Hear of Aircraft Expansion Ready to Meet Schedules, Says S.A.E. Chief

LOS ANGELES, Nov. 00.—The aircraft industry has expanded "far beyond anything the Government has asked us to do and will be capable of meeting the schedules laid down by the Government," Arthur Nutt, president of the Society of Automotive Engineers, told that organization's national aircraft production meeting in Los Angeles recently.

Mr. Nutt pointed out that the power of American airplane engines is ahead of that of the rest of the world. In the past 10 years, he stated, power has been doubled and trebled, although engines themselves have remained the same size.

## Sperry Orders Used to 'Educate' Small Firms

NEW YORK, Nov. 00.—This is the story of how a famous company's executives foresaw, three years ago, the tremendous industrial expansion made necessary by national defense.

The organization is the Sperry Gyroscope Company, makers of aeronautical devices, sound locators, searchlights, anti-aircraft directors and such marine products as gyro compasses and automatic steering apparatus.

To prepare for an expansion that has permitted a 500 per cent production increase, Sperry three years ago instituted a program of "educational orders" to subcontractors, giving smaller organizations a trial in manufacturing parts needed by the company. So successful was the program that today 35 companies, scattered throughout the country, are at work on Sperry orders.

"There is no one group of professional men who could take better advantage of flying than the traveling salesman," says W. T. Piper, head of the corporation.

IT PAYS TO FLY! With the posting of signs in all purchasing departments offices reading: "To All Salesmen: Why Don't You Fly Here?" officials of the Piper Aircraft Corporation at Lock Haven, Pa., have decreed "unrestricted warfare" on all itinerant salesmen who don't fly there to make their calls of solicitation.